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# U. S. DEPARTMENT OF AGRICULTURE

FARMERS' BULLETIN No. 1490

## HOG-LOT EQUIPMENT



**F**ARMERS in the principal corn-growing States have recognized for many years that one of the quickest and surest ways to market their crops is through the medium of hogs.

In recent years farmers in all parts of the country, to a greater or less extent, have undertaken the business of hog growing.

Success in this undertaking depends largely on proper management, which in turn is facilitated by the use of suitable equipment.

The purpose of this bulletin is to discuss the desirable equipment for growing and fattening hogs economically, and to suggest methods of construction and necessary materials for fences, feeders, shades, waterers, and other appliances.

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# HOG-LOT EQUIPMENT

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## FENCES

**D**EFFECTIVE FENCES are responsible as much as any one thing for annoyance, disagreement among neighbors, damage to gardens and crops, and often for the appearance of disease. Every hog owner has need for fences that will make the paddock, field, or farm hog-tight. The average farm fence is not satisfactory for its purpose, more often because of its faulty construction than because the materials used were unsuitable. The fact that fencing materials are expensive and construction costs are high makes it desirable that permanent fences be properly built.

Woven wire makes the most practical hog-tight fence. For inclosing large fields (10 to 20 acres or more) the 26-inch fence is probably the best to use. The stay wires should be 6 inches apart, of not less than No. 11 size, the top and bottom horizontal wires No. 9, and the other wires not smaller than No. 12. For inclosing pastures or lots of from 1 to 10 acres the fence should be 32 inches, and for smaller lots not less than 36 inches high. The fence around a boar lot should be 48 inches high and made of No. 9 wire. Woven wire of any kind is not desirable for inclosing a lot 100 feet square or smaller. Good, substantial lumber should be used for that purpose.

The durability of any wire fence depends more on the corner posts than on anything else. The wire must be stretched taut, for hogs soon attempt to get through a slack fence. It is impossible to stretch and keep taut any fence if the corner posts are not securely set.

<sup>1</sup> Deceased.

<sup>2</sup> The writers acknowledge the valuable assistance of John H. Zeller, of the Animal Husbandry Division, in preparing material for this bulletin. The Bureau of Agricultural Engineering prepared all drawings of equipment shown in this bulletin, for which the writers express their appreciation. Requests for any working drawing of the various articles of equipment should be sent direct to that Bureau, and in doing so reference should be made to the design number at the bottom of the illustration.

It is desirable to stretch a strand of barbed wire beneath the woven wire and staple it to the posts about 1 inch from the ground to prevent hogs from breaking out. The larger fields may be used also for other kinds of livestock. In that case, when the 26-inch fence is used, a wire should be stretched and stapled about 6 inches above the top of the woven wire and then as many strands of wire above that as may be needed.

To make hog-tight fence lines through which streams pass it is necessary to construct swinging floodgates,<sup>3</sup> as the particular conditions may require. The gates must be made to swing only in the



FIG. 1.—Braced corner post showing horizontal brace, wire, and "dead man"

direction of the current and be so guarded that hogs can not pass through them. It is necessary also to make the gates so that they can not collect trash from the streams.

#### CORNER POSTS

The corner and second posts should be set about 8 feet apart. Both should be set deep; in most soils 4 feet is necessary, and the earth should be well tamped. A horizontal brace, using a 4 by 6 inch

<sup>3</sup> Design No. 1625 for a floodgate suitable for the purpose may be had from the Bureau of Agricultural Engineering.

timber of proper length or a 4 or 5 inch round post, should be notched into the corner and second posts about 8 inches below the top. From the second post at the brace a strand of No. 8 galvanized wire is carried on each side of the corner post at the level of the ground and beyond in a straight line through a trench to a "dead man" or anchor about 2 feet long placed crosswise to the trench. Twisting the two wires between the anchor and the post and between the two posts will tighten the anchor against the trench banks and securely hold the brace and the braced posts to each other. This causes the two



FIG. 2.—Braced corner post with "dead man" buried and wire twisted

posts, the brace, and the brace wires to form a unit which will give the maximum stability to the corner post for resisting the tension of the fence wire. (See figs. 1 and 2.)

#### INTERMEDIATE POSTS

If the corner post is of sufficient size and well anchored, the intermediate posts are not of so great importance, but they should be of good, lasting material and well set. The most durable wooden posts are red cedar, locust, white oak, catalpa, mulberry, and chestnut. The durability of wooden posts may be greatly increased by treating

them with creosote before they are set. *Farmers' Bulletin 744*, "Preservative Treatment of Timber," discusses the method of applying the treatment. Concrete, iron, and steel posts are good, but their use depends to some extent on the cost.

The intermediate posts should be set from 18 to 24 inches deep and be well tamped. The fence line should be straight, which can be done by first setting the corners and stretching a wire or cord from one corner to the other for alignment.

The intermediate posts in the fence around the larger fields should not be more than 16 feet apart with a half-length post between. For fields of from 1 to 10 acres they should be about 12 feet apart, and for a small lot 8 feet.

#### STRETCHING THE WIRE

After fastening one end of the wire securely to a braced end or corner post and making all necessary splices, the wire should be

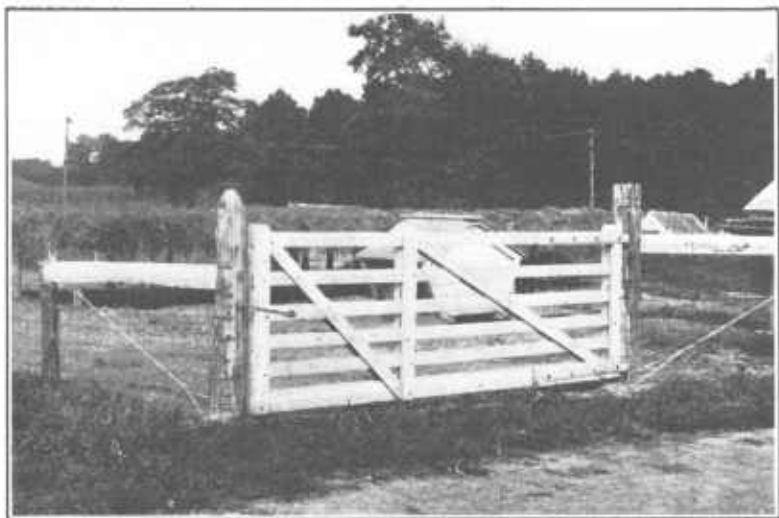


FIG. 3.—Farm gate well braced, with good, substantial hinges

unrolled along the fence line with the lowest bar next to the line of posts. The stretching device is then securely attached near the free end of the roll of wire at a point about halfway between the corner or end post and the second post.

In stretching it is necessary to lift the fence frequently from the ground at different points to prevent dragging over projections and bending or kinking the wire.

The wire should be stretched evenly, the top and bottom bars having about the same tension. When the fence is stretched taut it can be securely stapled to the end post or one next to it.

The bars should be stapled to the line posts with staples of sufficient length for securely fastening them to the post, but the staples should not be driven in so far as to interfere with the contraction and expansion of the fence due to changes of temperature.

## GATES

Hogs are very destructive to growing crops, and every effort should be made to keep them in the desired inclosure. The gate to the hog lot is used daily, often many times a day; consequently its construction should be well planned. A farm gate that is not well made and well hung is a source of constant trouble. The whole construction of the fence may be of the best, but if the gate design is faulty hogs will get out and much trouble will result. In making farm gates an added expense for providing well-seasoned material, bolts, and good, heavy hinges for hanging them is certainly justified.

Figures 3 and 4 show a good, strong, well-constructed gate, hung on heavy hinges.

## WATERERS

When the hog lot is supplied with a natural spring or a stream of good water, this adds materially to the success of hog produc-

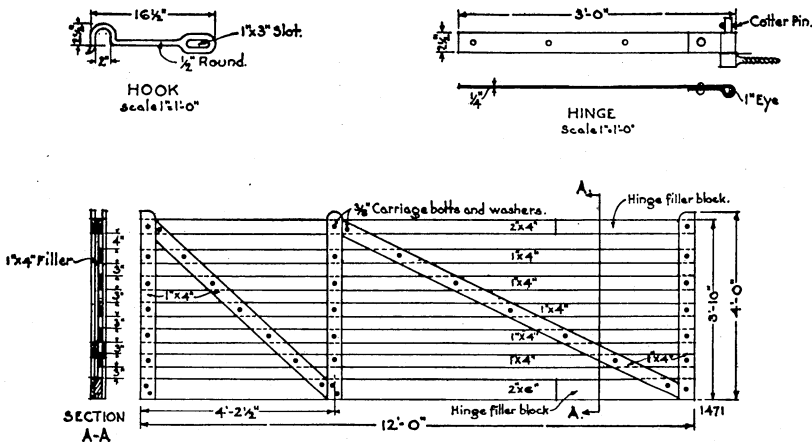


FIG. 4.—Detailed plan of gate shown in Figure 3. (Design No. 1471)

tion on that farm. When such natural water supplies are not available, it is necessary to use some type of waterer that will provide the hogs with water frequently and in sufficient quantity. Any type of automatic waterer is much more desirable than frequent watering in open troughs. In all instances it is necessary to consider the matter of sanitation, because watering troughs and the drinking vessels which are a part of the automatic waterers quickly become foul and insanitary. The cups should be so constructed that there will be no opportunity for the accumulation of mud that may not easily be removed.

Figures 5 and 6 show a type of waterer that gives satisfactory results when the weather is not freezing. A tight barrel with both heads in good condition is placed on a water-tight platform surrounded by a 4-inch ledge, forming drinking vessels between the ledge and the sides of the barrel. The drinking box is built of such size as to permit a barrel to be snugly fitted within it. The sides of the drinking portion are 4 inches in height. A hole must be bored





FIG. 5.—A type of home-constructed, movable automatic waterer

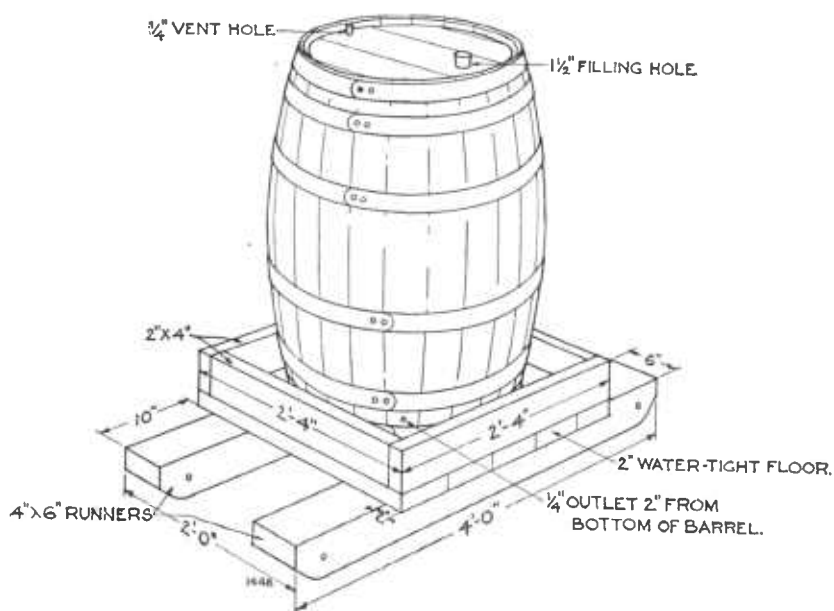


FIG. 6.—Detailed plan for construction of waterer shown in Figure 5. (Design No. 1448)

in the side of the barrel at a point which will place the top of the hole 1 inch below the top of the ledge. When filling the barrel with water it is necessary to plug this hole and fill the barrel through a hole made in the head. When the barrel is full plug the hole in the head and open the hole in the drinking vessel. The water will fill the box to a level just above the top of the hole in the side of the barrel.

Many waterers are made in which a valve and float are used to form the automatic feature. Some are successful though many are not. The collection of mud about the valve makes it possible for the water to escape and overflow from the box. As a general rule waterers need frequent attention.

There are many iron and steel automatic waterers on the market, most of which are very satisfactory. In parts of the United States where freezing temperatures prevail during the winter, the metal waterer which is provided with a lamp for heating is satisfactory and practical.

#### TROUGHS

On the average farm usually the most insanitary part of the equipment is the feed trough. The trough is generally made of wood either V shaped or having a flat bottom and constructed of boards. It is seldom that feeding troughs are given a thorough cleaning;

it is not long, therefore, particularly when slop is fed, before they become extremely foul. Figures 7 and 8 illustrate the flat-bottomed trough so constructed that it is not easily overturned and of such design that slop can be poured into it without interference by the hogs. This style of trough can be used for feeding slop, ground feed, and any kind of grain except corn on the ear. It has an additional advantage in that it is practically impossible for hogs to get their feet into the trough while eating.

For mature animals the trough should be 24 inches in width; for growing pigs, from 16 to 20 inches. The length of these troughs depends on the number of hogs to be fed. By using a spade or a hoe it is comparatively easy to keep a trough of this type free from accumulation of feed or mud.

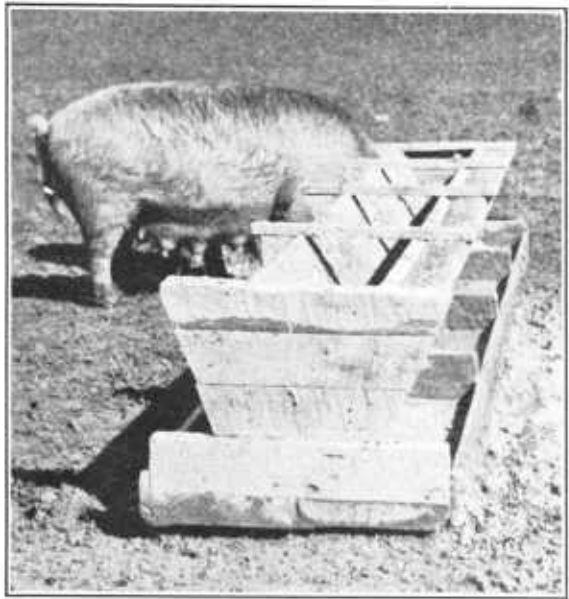


FIG. 7.—Flat-bottomed trough

There are many varieties of metal troughs on the market, each being more or less practical. A suitable type of metal trough is likely to be much more sanitary than any built of wood. Troughs should be cleaned early, before any remaining slop sours. A slight dusting of slaked lime or whitewash will assist materially in keeping them in proper condition.

#### FEEDING FLOORS OR PLATFORMS

Grain is too valuable to allow any preventable waste to occur when feeding hogs. There is a certain amount of waste when grain is fed in the dust or mud. A good, convenient feeding floor or platform is one made of concrete. Wooden platforms answer the purpose for a time, but become insanitary, soon rot out, and generally cost more in the end than concrete. Concrete feeding floors should be made somewhat rough to prevent the hogs from slipping. They should be built with a slight slope so that they may be washed and

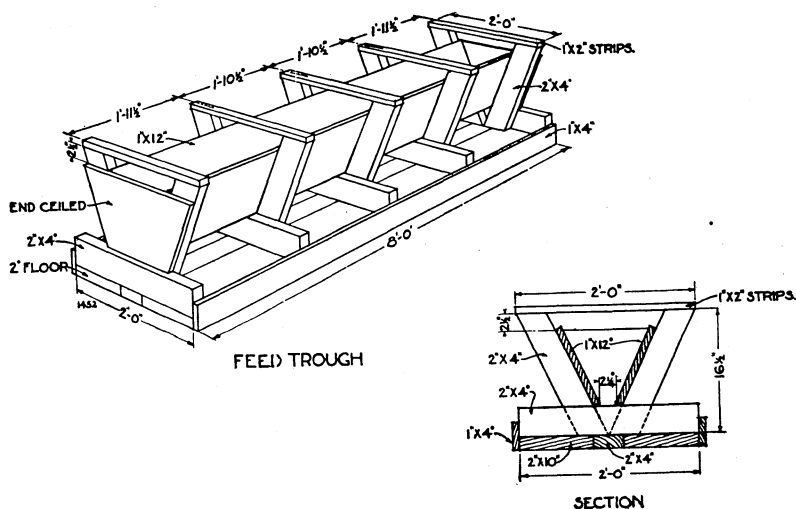


FIG. 8.—Detailed plan for construction of flat-bottomed trough shown in Figure 7. (Design No. 1452)

drained readily. There should be a rise of about 2 inches all around the outside to prevent the grain from being pushed off by the hogs while eating. (See fig. 9.)

Feeding platforms<sup>4</sup> should be built high enough above the ground to prevent the water from washing over them during a heavy rain. Easy approaches must be provided so that hogs can get on to the platform without difficulty. If the platform is made on a hillside so that there is a considerable drop from the edge of the feeding floor to the ground below, a fence should be built around those parts to prevent the hogs from falling off.

#### SELF-FEEDERS

A self-feeder is a necessary part of the equipment of a well-operated hog farm. Experiments have shown that when self-feeders

<sup>4</sup> Farmers' Bulletin 1480, entitled "Small Concrete Construction for the Farm," describes the construction of feeding floors.

are used hogs can be economically and profitably fed and fattened for market.

When hogs have access to different kinds of feed necessary to produce pork they balance their rations in a satisfactory way. The feeds should be placed in separate feeders or in separate compartments of the same feeder. The different feeds should not be mixed by the herdsman and fed in a self-feeder; this would tend to defeat its chief object, that of selection of the individual feeds as dictated by the appetite.

Numerous types of self-feeders are manufactured and sold commercially. A serviceable type of feeder may be readily constructed by any farmer with the usual building materials that are to be found on a farm. Figures 10 and 11 show a type of feeder that is successful and easily constructed. This feeder is provided with a movable board, secured with thumbscrews, which enables the flow of feed to



FIG. 9.—A good hog feeding floor

be accurately regulated. It is necessary to regulate this board according to the character of the feed used. Any type of self-feeder should be examined frequently to see that it is properly adjusted and supplied with feed. Whenever the feed lot becomes muddy, it is necessary to give the feeder frequent attention so that the narrow slot does not get choked and restrict the quantity of feed for the pigs.

When a satisfactory type of feeder has been selected, it is advisable to have regard for its labor-saving advantages and to construct the hopper portion large enough to prevent the necessity for frequent filling. Most of the feeders are made with a double hopper so that both sides may be used simultaneously.

#### CREEPS

Pigs thrive better if, when they are about 3 weeks old, they are fed something to supplement the mother's milk. In order to provide

such feed it is desirable to place it in an inclosure where larger hogs can not reach it. A pen or creep equipped with a self-feeder should be provided for furnishing grain to the smaller pigs (fig. 12). There

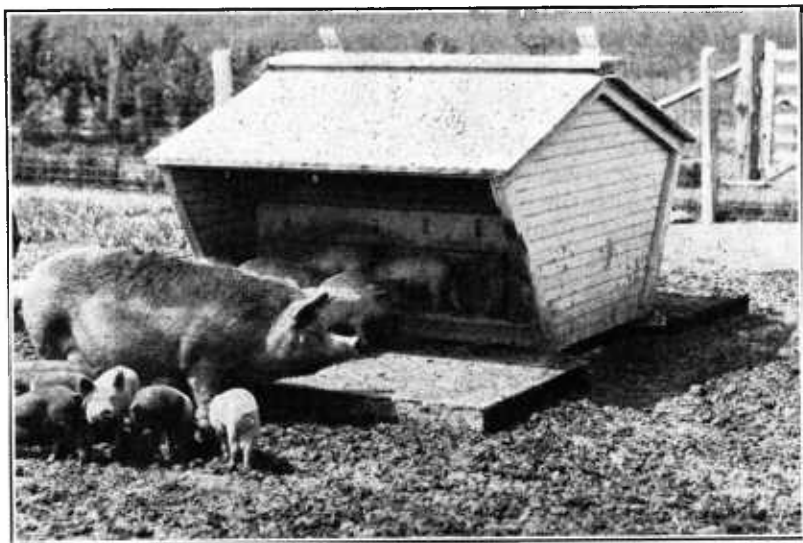


FIG. 10.—Self-feeder which may be used for sows and litters and fattening hogs

should be two or more openings through which the little pigs can pass, but narrow enough to keep the older hogs out. Figure 13 shows a satisfactory plan for making these openings and at the same time indicates the appearance of a satisfactorily constructed creep.

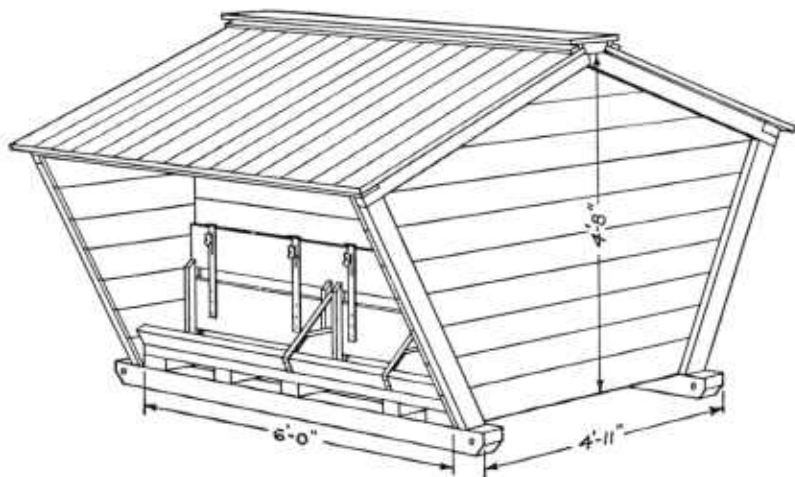


FIG. 11.—Detailed plan for construction of self-feeder. (Design No. 1636)

It is a common practice to provide openings for the smaller pigs by removing one of the lower boards, which allows the small pigs an opportunity to crawl into the inclosure. Such a plan is very objec-

tionable, however, because of its tendency to produce low backs in the pigs, thereby lessening their value as breeding and market



FIG. 12.—Creep for suckling pigs

animals. It is very much better to have the opening narrow but sufficiently high at all times to prevent any necessity for the pigs to lower their backs when passing in or out.

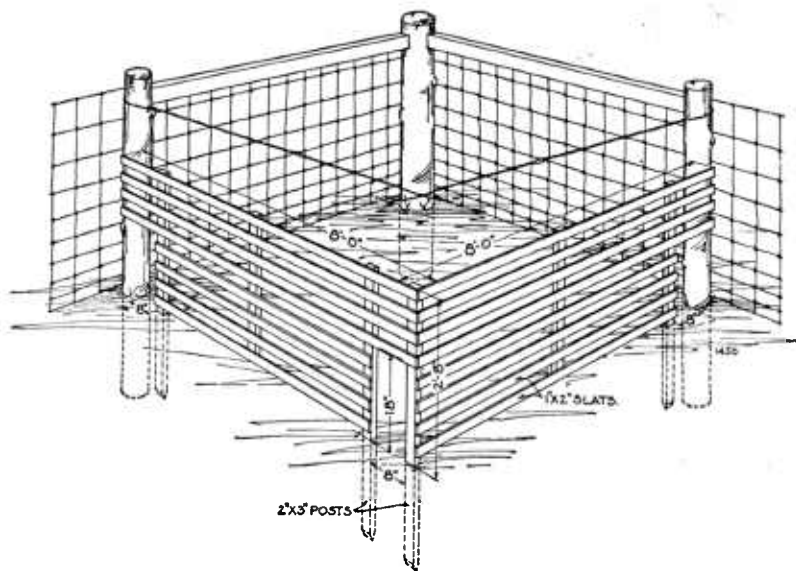


FIG. 13.—Detailed plan for construction of creep shown in Figure 12. (Design No. 1450)

#### HAY FEEDERS

When feeding hogs in winter, it is very desirable to include a certain quantity of first-class legume hay. Very often when hogs

have access to a stack of hay or when it is fed to them on the ground much waste occurs. Suitable racks keep the hay from becoming trampled and soiled and prevent the waste of the leaves of alfalfa, soybean, or clover hay, by collecting them in the troughs at the bottom of the rack. Figures 14 and 15 show an easily constructed hayrack which is a valuable part of the hog-farm equipment.

#### SHADES

Hogs must be provided with shade in hot weather. Where trees are close enough together to produce a uniform shade it is undoubtedly better than any artificial shade that can be constructed. Small buildings with tight walls are not satisfactory. Although the sun's rays are broken by the roof, the heat is not modified to any ap-

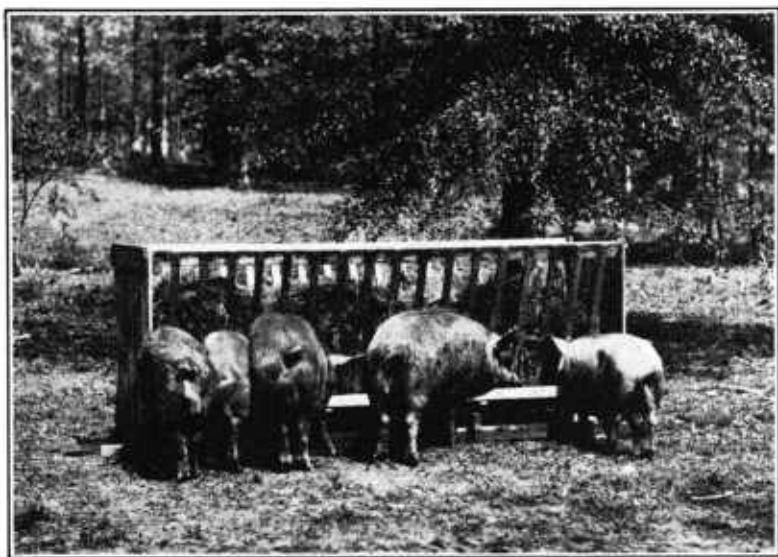


FIG. 14.—Hayrack for feeding alfalfa hay to hogs

preciable extent. There should be as much circulation of air as possible in any shade that is provided for hogs. Large buildings well supplied with doors and windows usually are satisfactory, but small buildings, such as individual houses regardless of type, do not answer the purpose during hot weather. Some individual houses have been designed with hinged sides which can be raised and fastened. In a measure they provide for free circulation of air but do not break the heat rays sufficiently. Figure 16 shows a type of shade constructed at the United States Experiment Farm at Beltsville, Md., and well adapted to its purpose during extreme heat.

This shade is easily and cheaply constructed. Posts are set in the ground to a depth of about 3 feet, projecting  $3\frac{1}{2}$  to 4 feet above ground. On the top of these posts is built a framework strong enough to support 2 or 3 feet of straw, dried weeds, brush,

etc. A shade 20 by 40 feet requires three rows of five posts each, set 10 feet apart in each direction. If a shade of this kind is near a water supply, the dust which accumulates can be overcome by frequent wetting, which is best done by throwing water on the roof of the shade and allowing it to trickle through to the ground. Crude oil sprinkled occasionally under a shade of this kind also controls the dust nuisance to a considerable extent and at the same time assists in freeing the hogs of lice.

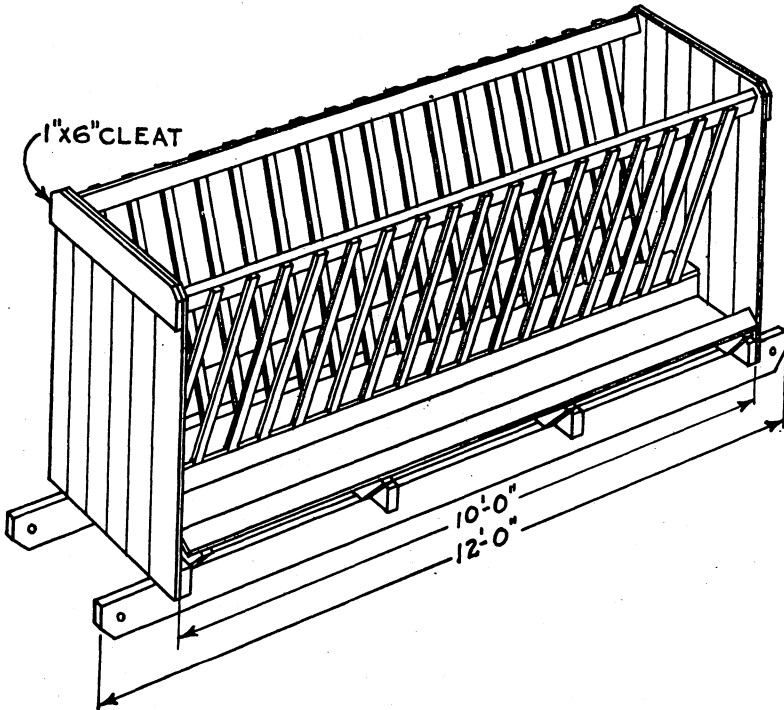


FIG. 15.—Detailed plan for construction of hayrack shown in Figure 14. (Design No. 2009)

#### OILERS AND DIPPING VATS

The hog louse is one of the pests with which the hog raiser has to contend in his operations. Petroleum in some form is probably one of the best things to use for suppressing lice. It may be applied through the use of mechanical oilers, by spraying, or by using a thin film of oil over the surface of the water in a dipping vat. Common crude oil may be purchased at a lower price than other oils and is the kind most generally used. Refined oils are more costly but no more effective than the crude form in suppressing lice. A hog oiler may be made by wrapping cloths or old sacks around a post, tying firmly, and saturating with crude oil. The disadvantage of this type of oiler is that it requires close attention to keep oil enough on the cloth to be of service. A gallon can may be secured to the top of the post with an opening which, allowing the oil to escape drop by drop upon the cloth, adds to the convenience of this type of oiler.



There are a number of more or less serviceable commercial oilers on the market. Most of them have a container, holding from 2 to 4 quarts of oil, which discharges the oil when the mechanism is moved by the hog rubbing against it. The container must be filled with oil and the openings through which the oil escapes kept open.

Dipping vats are in rather common use throughout the United States, but in the northern half it is not possible to use them with safety in cold weather. Dipping vats are generally made of concrete or galvanized iron. Vats made of wood do not resist decay well and are not sufficiently durable to justify their construction. Whenever galvanized-iron tanks are used they should be buried in pits lined with boards to support the sides of the tank. Concrete is the most satisfactory material out of which to construct a dipping vat. (See figs. 17 and 18.)



FIG. 16.—A cheaply constructed hog shade

The walls should be built with a good, rich mixture of concrete from 4 to 6 inches in thickness and with the bottom of the vat of similar thickness of concrete placed on well-tamped earth. The inside measurements of the vat when completed should be 4 feet 6 inches deep, 18 inches wide at the bottom, 30 inches wide at the top, and never less than 10 feet long on the bottom. The end at which the hogs pass out should form an incline of about 20° to 25°, slatted well so that the hogs can easily climb out. If the front or approach of the dipping vat is left entirely open, a hog is very liable to jump into the tank and splash out considerable of the dip. This can be prevented by building a roof over the approach, as shown in Figures 17 and 18. Provision should be made in the construction of the vat for drainage from the lowest point of the bottom, so that it can be emptied and cleaned frequently.

The dipping vat may be used as well for disinfection of hogs with a 3 per cent cresol solution after the simultaneous treatment for hog cholera has been given, and also for the dipping of hogs that are received at or shipped from the farm.

#### WALLOWS

Many of the so-called hog wallows on farms are insanitary, unsightly mudholes which should be abolished. Figure 19 shows a wallow which can be easily and cheaply constructed of concrete on a farm where there are no running streams. The bottom should be of sufficient thickness to prevent cracking and to support the weight which it must bear. A convenient size for a wallow of the type shown is 13 feet long and 10 feet wide by 12 inches deep at the

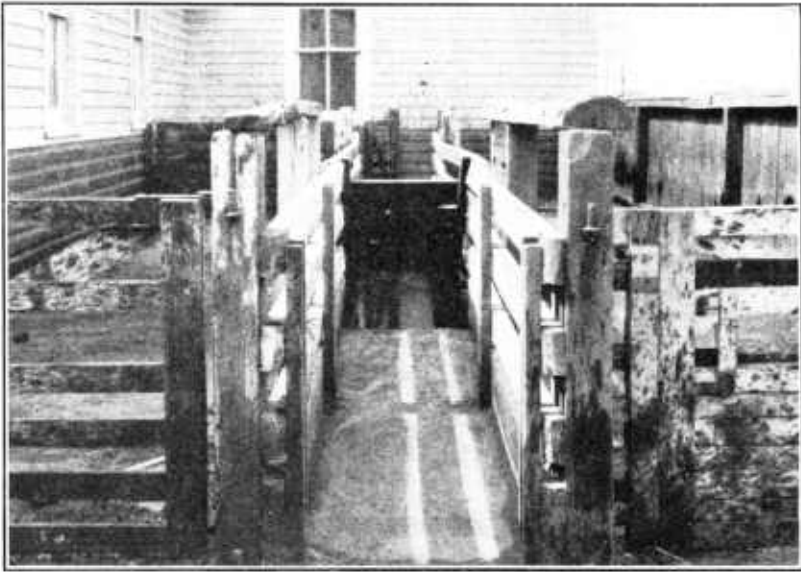


FIG. 17.—Dipping vat showing roof over approach to prevent hogs from jumping into vat

shallow end. The opposite end is 18 inches in depth with outlet in the bottom. The size of the wallow and the number of wallows necessary on any farm will be determined by the number of hogs kept.

#### BREEDING CRATES

Experience in mating hogs has shown that better results are obtained by keeping the boars and sows in separate paddocks and allowing but one service at mating time. Many experienced hog men use mature boars in the breeding herd. Often these boars are of such size that they can not be mated successfully to young sows without the use of a breeding crate.

Figure 20 shows a homemade crate that is easily constructed and used with success. The floor of the crate is 9 feet in length. Slats

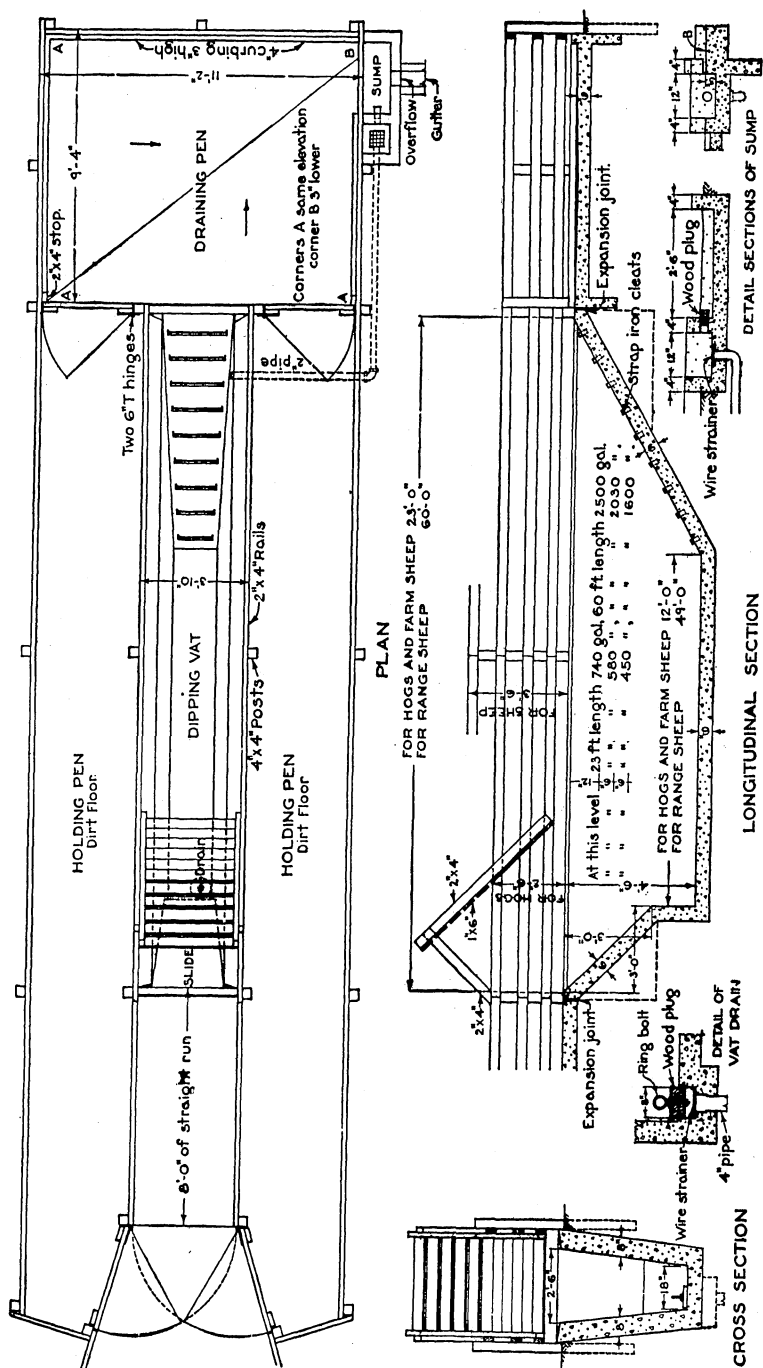


FIG. 18.—Detailed construction of dipping vat shown in Figure 17. (Design No. 1758)

1 by 2 inches to keep the hog from slipping are nailed short distances apart throughout the entire length of the floor.

The front end of the crate is hinged to form a gate which may be opened to let the sow out after service. When she is driven into the crate a 2 by 4 inch bar is placed behind her to prevent her backing out. A 2 by 6 or 2 by 8 inch plank is placed on each side of the sow to support the front feet of the boar, the forward end resting on one of the crosspieces of the front end of the crate and the back end on the crossbar placed to prevent the sow from backing out.

The detailed plan of the crate is shown in Figure 21.

#### SHIPPING CRATES

Crates for shipping individual hogs should be constructed with three principal objects in view: (1) To make them perfectly secure so that no accident can happen in transit, (2) to get the maximum amount of space for the lumber used, and (3) to have them large

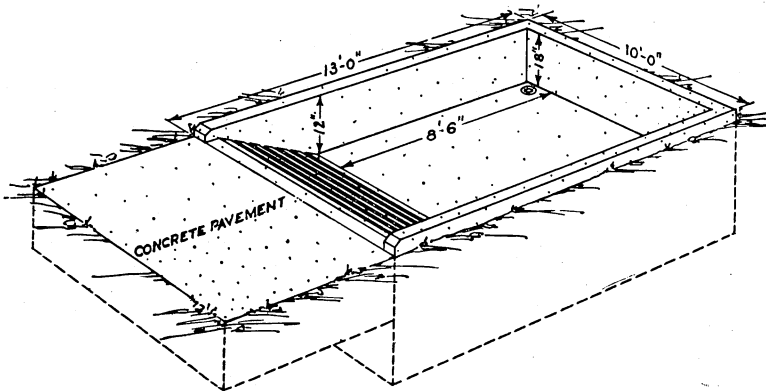


FIG. 19.—Detailed plan for construction of hog wallow. (Design No. 2129)

enough for comfort to the hog. Crates should be constructed of strong, light material and have a neat, attractive appearance. For the sides and ends  $\frac{3}{4}$ -inch or  $\frac{7}{8}$ -inch boards are sufficient. For the floors sound, rough boards full 1 inch thick should be used.

Figure 22 shows the construction of a crate to hold a hog weighing up to about 200 pounds.

#### HURDLES

One of the most convenient articles of equipment for the hog farm, especially where purebred hogs are bred, is a hurdle, which is useful in driving and handling hogs and in protecting both hogs and herdsman in handling mature boars. When moving individual hogs a hurdle is almost indispensable. Hinged hurdles, made by fastening two small, rectangular hurdles with strap hinges, are very convenient in cutting out single hogs from a bunch. Long, low hurdles may be placed in the form of a square and in this way are frequently used at shows to confine hogs temporarily while being shown.

A hurdle should be  $3\frac{1}{2}$  to 4 feet in length and about  $2\frac{1}{2}$  feet in height. It should be constructed of light material, so that it can be quickly and easily handled, but at the same time it must be strong. Figure 23 illustrates a very convenient hurdle made from a half rim of an old buggy wheel. The rim is covered solidly with

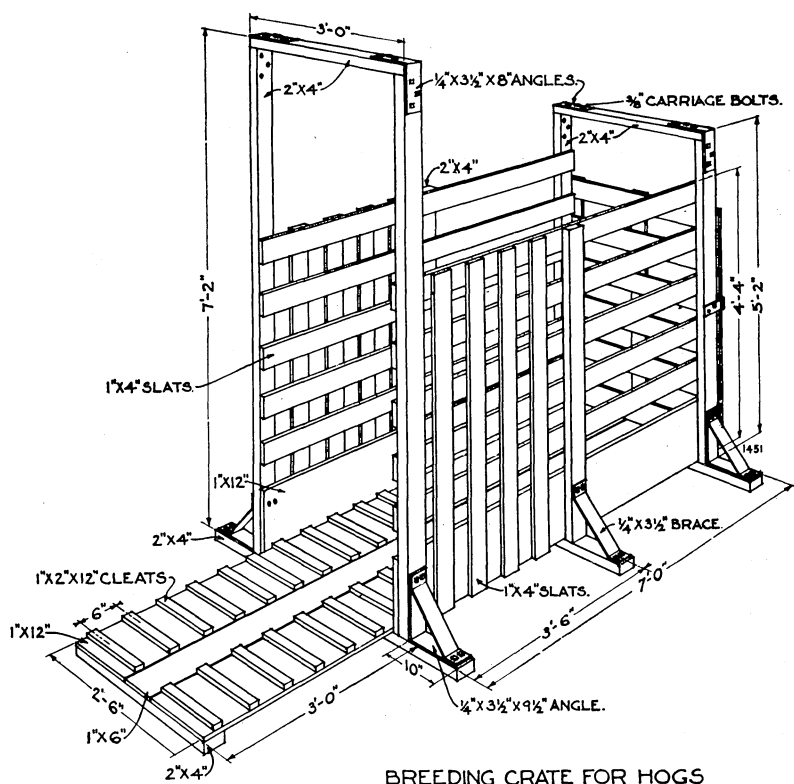


FIG. 20.—A homemade breeding crate with foot rests

$\frac{3}{8}$ -inch boards, leaving a space at the top for handling. Figure 24 shows plans of construction of three different hand hurdles.

#### LOADING CHUTES

Every hog farm should be equipped with a good chute conveniently situated. It should be built in connection with a small yard



BREEDING CRATE FOR HOGS

FIG. 21.—Detailed plan for construction of breeding crate. (Design No. 1451)

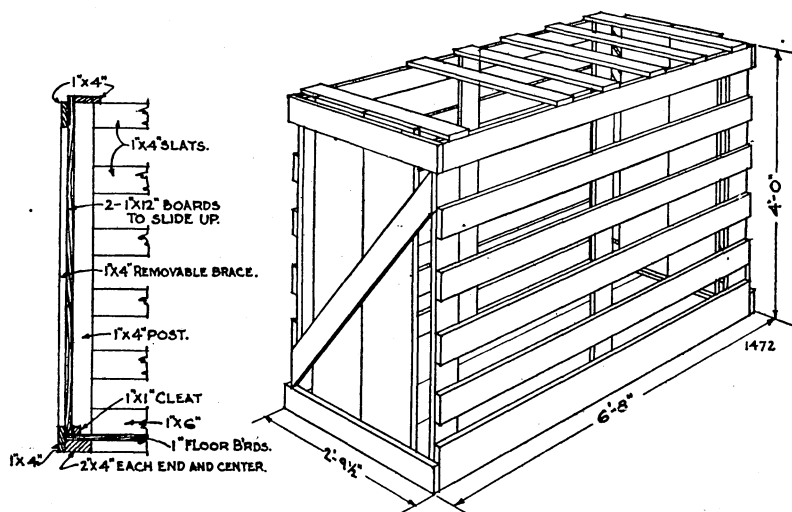


FIG. 22.—Detailed plan for construction of shipping crate. (Design No. 1472)

or pen and so arranged that the hog can be driven into it with little trouble. It is very difficult to drive a hog into a chute that rises or declines abruptly. A chute about 20 feet in length has such a gradual rise from level ground into the bed of an ordinary farm wagon that it is not difficult to drive hogs through in either direction (fig. 25).

Many loading chutes are built too wide, giving the hog an opportunity to turn around. A chute should not be more than 24 inches wide with sides about 30 inches high. There should be a gate at the loading end to slide up and down or swing inside the chute, to close behind the hog to keep it from backing out. A swinging gate can not be built close to the floor and is therefore not so convenient for handling small pigs.

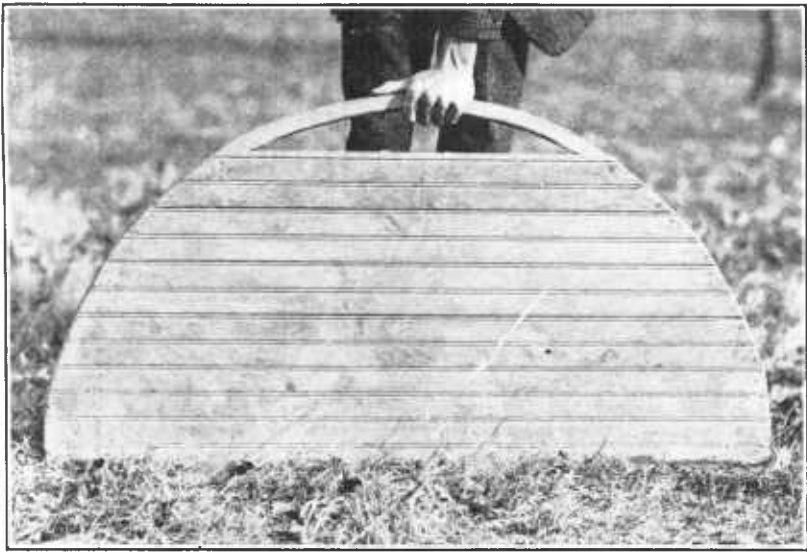


FIG. 23.—A convenient hand hurdle

#### SCALES

Suitable scales for weighing hogs and feed are necessary for the proper information of the hog grower. When buying or selling hogs or feed, accurate weights are essential in making good business transactions. Platform scales should be equipped with substantial rails and gates for convenience in holding hogs on the platform while the weights are obtained (fig. 26). Hurdles for driving and guiding the hogs make it possible to use such scales conveniently. The type and size of scales to be provided must be determined by the purpose and amount of use to which they will be put. The ordinary hay scales answer the purpose if provided with removable panels, but many advantages are to be had also with smaller scales in the runway of the hog house. When convenient and suitable scales are available, stock can be weighed when received and before loading for shipment.

## RECORD BOOKS

Every properly conducted business requires some system of record to show the financial results of the enterprise. The hog business represents an investment in stock, equipment, and feed, and it requires a daily expenditure of labor. Fluctuations in values throughout the year make it impossible to form correct ideas of

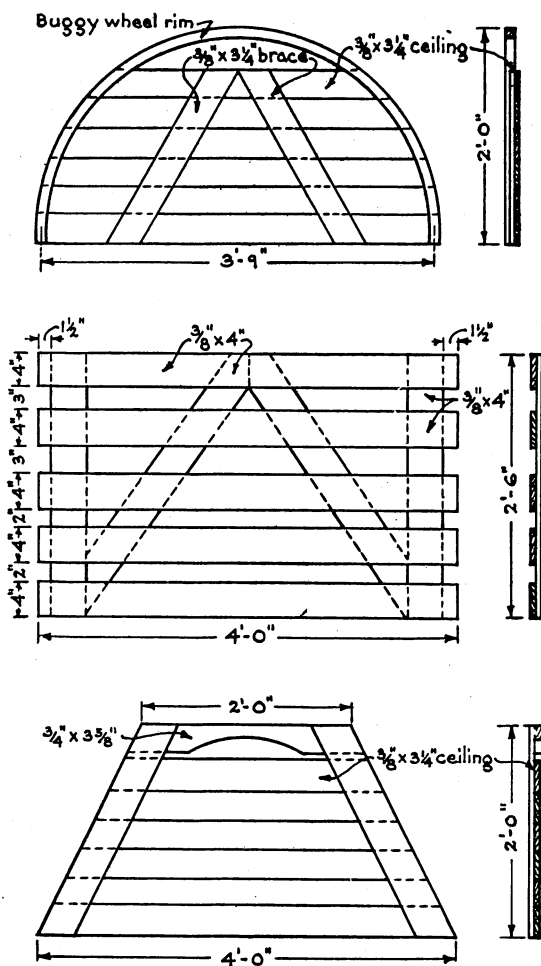


FIG. 24.—Detailed plan for construction of hurdles. (Design No. 1454)

profits unless suitable accounts are kept. Breeders of purebred hogs must maintain accurate information on the registry numbers of the breeding animals and their progeny, the time of service, and the date of farrowing of the litters. It is very necessary, therefore, for hog breeders to have suitable record books for all such information. The several breed-record associations furnish such books at small cost.



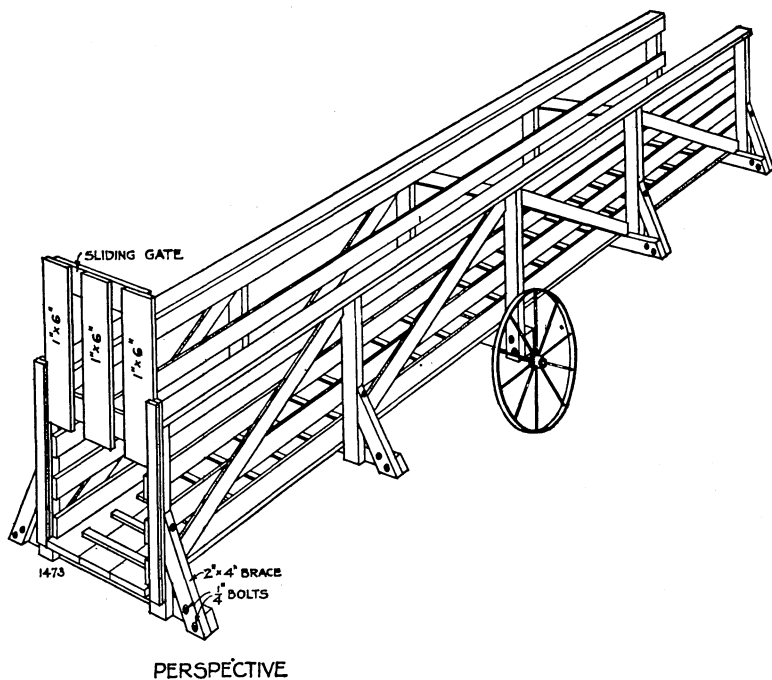


FIG. 25.—Detailed plan for construction of movable loading chute. (Design No. 1473)

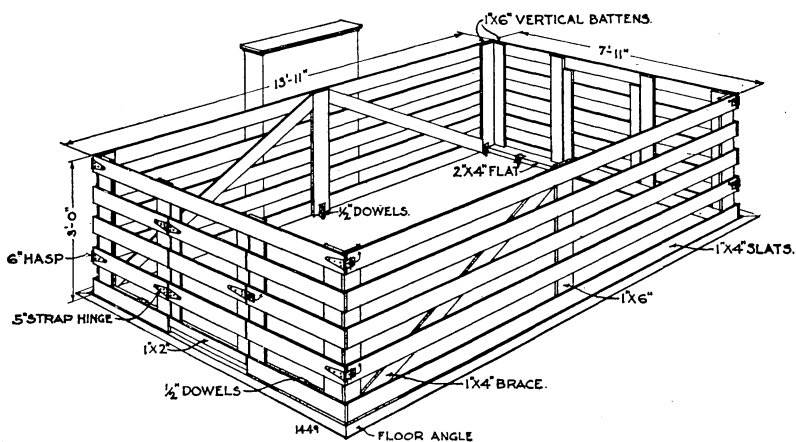


FIG. 26.—Detailed plan for construction of portable scale rack. (Design No. 1449)

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